

## **REMARKS**

Claims 1-12 and 14-19 are pending with claim 19 added by this paper. Support for the new claim may be found in the specification at page 4, lines 11-15.

### **Election Requirement**

Applicants hereby affirm the election of claims 1-12.

### **Claim Rejections Under 35 U.S.C. §112, first and second paragraphs**

Claim 9 stands rejected as allegedly containing subject matter not described in the specification as to reasonably convey to one skilled in the relevant that the inventors, at the time of the application filing, had possession of the claimed invention. Particularly, the Action alleges that the feature "above 0 to at most 20% ... of at least one promoter element", is not supported in the specification. The Action admits that support is provided for the ranges at most 20%, 0.1-20%, and 0-10%.

To expedite the issuance of the application, Applicants have amended claim 9 to obviate this rejection. Consequently, Applicants respectfully submit that this rejection should be withdrawn.

Furthermore, Applicants respectfully submit that this amendment does not narrow the scope of claim 9, in as much that claim 1 by positively reciting a promoter element requires an amount of a promoter element above 0.

Claims 1-12 stand rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. Applicants have amended these claims to obviate the rejections. Applicants respectfully submit that these amendments are made for clarification and do not narrow the scope of the claims.

### **Claims Rejections Under 35 U.S.C. §103**

Claims 1, 5-7 and 9-12 stand rejected as allegedly being unpatentable over U.S. Patent

No. 3,730,878 (Pollitzer) in view of U.S. Patent No. 5,393,409 (Jan). The Action admits that Pollitzer does not teach that the catalytic composition contains at least one promoter element selected from the group consisting of phosphorous, boron and silicon, but attempts to cure this deficiency by citing Jan. Applicants respectfully traverse these rejections.

Pollitzer discloses a mixture of (1) a porous amorphous carrier material containing a group VI-B metal component, and (2) a porous, zeolite carrier material containing a group VIII metal component. See col. 2, lines 6-12. Pollitzer discloses that the group VIII and VI metal components are separately combined with the respective carriers, and then mixed together (col. 4, lines 55-66). Pollitzer touts that group VI-B metals, particularly molybdenum and tungsten, are excellent promoters for effecting hydroprocessing reactions, especially for removing and/or converting contaminating influences (col. 3, lines 15-20).

Jan discloses combining a zeolite and a Group VIII metal component impregnated onto a nonzeolitic portion, *i.e.*, inorganic oxide support material (col. 7, lines 41-col. 8, line 20). Furthermore, as readily apparent from its method of preparation, as disclosed at col. 7, lines 42-50, a group VIII component tends to be excluded from the zeolite. Jan further discloses that when desired, a phosphorous, as well as a boron, component may also be included in the catalyst. However, the presence of phosphorous and boron is not preferred. See col. 8, lines 22-34.

However, to establish *prima facie* obviousness of a claimed invention, all claim features must be taught or suggested by the prior art. See *In re Royka*, 490 F. 2d. 981, 180 USPQ 580 (CCPA 1974), M.P.E.P. §2143.03. Furthermore, the mere fact that references can be combined or modified does not render the resultant combination *prima facie* obvious unless the prior art also suggests the desirability of the combination. See *In re Mills*, 916 F. 2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990), M.P.E.P. §2143.01.

Both Pollitzer and Jan fail to teach or suggest a zeolite having a porous network containing at least one element of group VI-B or group VIII. Moreover, there is no desirability to combine these references. Pollitzer discloses that excellent promoters for affecting hydroprocessing reactions include metals of group VI-B. However, Pollitzer is absolutely silent about any desirability to include other promoters. With respect to Jan, Jan discloses the use of boron and phosphorous, but states that their presence is not preferred. Consequently, Applicants

respectfully submit that there is insufficient motivation to combine these references.

With respect to Pollitzer, the method of preparation is different from a method of the present invention which leads to a different catalyst because the metal in the present invention is in the porous network of the zeolite.

Supererogatorily, attached hereto is a declaration by one of skill in the art evidencing this difference. The declarant attests that catalysts E and F (relevant to Pollitzer) provide worse conversion levels per fraction  $380^{\circ}\text{C}^{+}$  and worse selectivities than catalysts that contain molybdenum in the porous network of the zeolite, namely catalysts C and D (relevant to the present invention). Furthermore, the presence of molybdenum in the porous network of the zeolite enables improved performances in hydrotreatment. Particularly, Pollitzer discloses catalysts containing molybdenum on the exterior surfaces of the zeolite, and as such, these catalysts fail to obtain the significant and unexpected results as attested in the declaration. Furthermore, a comparison of catalyst C with D, and E with F shows that by increasing the amount of zeolite, the activity of the catalyst, as indicated by the temperature level required to obtain 70% of conversion of feedstock, is considerably increased. In the case where molybdenum is deposited on the exterior surface of the zeolite (relevant to Pollitzer), this increase of activity leads to a significant loss of selectivity. In the case where molybdenum is deposited in the porous network of the zeolite (relevant to the claimed invention), the level of selectivity is maintained when the amount of zeolite is increased. These results are significant and unexpected.

In view of the declaration, not only do the cited references fail to teach or suggest all the features in the claimed invention, but the present invention also exhibits significant and unexpected results. In view of these results, Applicants submit that there is more than ample evidence in the record for the Examiner to withdraw these rejections.

In view of the above, Applicants respectfully submit that the rejections should be withdrawn.

Claims 2-3 stand rejected as allegedly being unpatentable over Pollitzer in view of Jan, and further in view of U.S. Patent No. 4,777,157 (Koepeke). Applicants respectfully traverse these rejections.

Koepke discloses a catalyst containing at least one niobium component combined with at least one cracking component. Preferably, the catalyst further contains at least one group VIII metal component. See col. 2, lines 23-34. Koepke further discloses suitable cracking components including silica-aluminas and crystalline molecular sieves having cracking activity. The crystalline molecular sieves may be zeolitic or nonzeolitic, where zeolitic sieves may be ZSM-5 types zeolites, Y zeolites, and X zeolites. See col. 2, lines 35-60. Koepke also discloses that the catalyst may further contain hydrogenation components of group VIB or a group VIII metal (col. 2, lines 13-16). Koepke discloses making this catalyst by mixing or comulling (col. 5, line 20- col. 6, line 14.). During its manufacture, the preferred catalyst of Koepke has niobium and hydrogenation components deposited on the exterior surface of the cracking component (col. 7, lines 2-4).

Consequently, Koepke suffers from the same disadvantages as Pollitzer and Jan. Namely, Koepke fails to disclose a zeolite having a porous network containing at least one element of group VI-B and and/or group VIII. Furthermore, Koepke fails to teach or suggest any desirability for incorporating boron or phosphorous. Consequently, it also suffers from similar disadvantages as Pollitzer. Consequently, there is insufficient motivation for one skilled in the art to combine these references to render the claimed invention unobvious.

Claim 4 stands rejected as allegedly being unpatentable over Pollitzer in view of Jan, and further in view of U.S. Patent No. 5,972,832 (Shi). Applicants respectfully traverse these rejections.

Shi discloses a catalyst composed of fluorine, nickel oxide, tungsten oxide, and a carrier, where the carrier is composed of alumina and zeolite (col. 2, lines 20-28). Shi's catalyst is prepared by mixing an alumina precursor and a zeolite to obtain the catalyst carrier, then impregnating the carrier sequentially with a fluorine-containing aqueous solution and a nickel-tungsten-containing aqueous solution (col. 2, lines 29-46).

However, Shi suffers from the same disadvantages as the other references, namely, that Shi fails to teach or suggest a group VI or VIII metal contained in the porous network of the zeolite nor the presence of any promoter components. Thus, it suffers generally from the same disadvantages as the other references. Consequently, Applicants respectfully submit that these

rejections should be withdrawn.

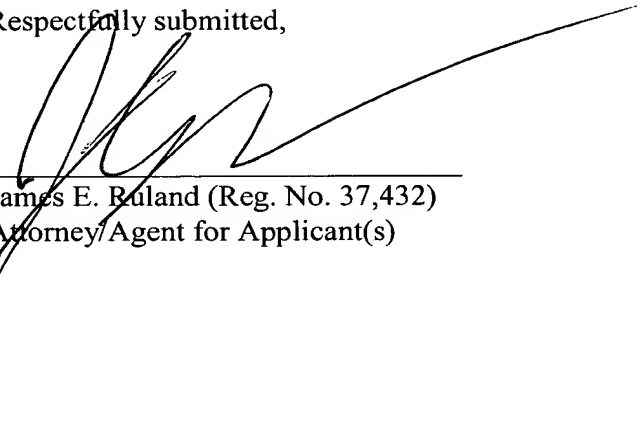
**Claims Rejections Under the Judicially Created Doctrine of Obviousness-Double Patenting**

Claims 1-12 stand provisionally rejected over claims 1-11 and 22 of copending application No. 09/603,837. With respect to that application, Applicants in their paper filed June 26, 2002, indicated that they would have no objection to filing a Terminal Disclaimer, assuming that application is otherwise in condition for allowance. Consequently, Applicants respectfully submit that if such a disclaimer is filed in the other application, then these rejections should be withdrawn. Alternatively, if no such disclaimer is filed in the other application, Applicants will have no objection to filing a terminal disclaimer once the application is otherwise in condition for allowance.

In view of the above remarks, favorable reconsideration is courteously requested. Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**VERSIONS WITH MARKINGS TO SHOW CHANGES MADE.**" If there are any remaining issues which can be expedited by a telephone conference, the Examiner is courteously invited to telephone counsel at the number indicated below.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE SPECIFICATION**

**Paragraph beginning at line 9 of page 22 has been amended as follows:**

To obtain catalyst D, an amount of 70% by weight of the zeolite that is impregnated with molybdenum prepared above with 30% by weight of SB3-type alumina that is provided by the Condéa Company is used. The mixed paste is then extruded through a die with a 1.4 mm diameter. The extrudates are then dried for one night at 120°C under air then calcined at 550°C under air. The extrudates are then impregnated in the dry state, i.e., by filling by an aqueous solution of a mixture of ammonium heptamolybdate, nickel nitrate and orthophosphoric acid so as to deposit 1.5% by weight of nickel oxide NiO, 7.3% [5.0%] by weight of molybdenum oxide MoO<sub>3</sub>, and 2.5% by weight of phosphorus oxide P<sub>2</sub>O<sub>5</sub>. It is dried for one night at 120°C under air, and finally it is calcined under air at 550°C. In view of the initial presence of molybdenum in the zeolite, the catalyst contains by weight of oxide: 1.5% by weight of nickel oxide NiO, 7.3% by weight of molybdenum oxide MoO<sub>3</sub>, and 2.5% by weight of phosphorus oxide P<sub>2</sub>O<sub>5</sub>. The final catalyst contains 60.4% by weight of the Y zeolite.

**Subtitle beginning at line 13 of page 29**

**has been amended as follows:**

**Example [4] 6: Comparison of the Catalysts of Hydrocracking of a Vacuum**

**Distillate with Higher Pressure**

**IN THE CLAIMS:**

Claims 1, 9 and 10 have been amended as follows:

1. (Twice Amended) A catalyst comprising at least one oxide matrix, at least one zeolite having a porous network and at least one hydro-dehydrogenating element located [at] on the matrix and selected from the group consisting of elements of groups VIB and VIII, wherein the zeolite contains in said porous network at least one element of group VIB and/or group VIII, the catalyst also comprising at least one promoter element selected from the group consisting of boron, silicon, and phosphorus.

9. (Twice Amended) A catalyst according to claim 1, containing in % by weight [of the final catalyst]:

- 0.1 to 98.7% of zeolite,
- 1 to 99.7% of matrix,
- at least one of the elements of groups VIB and/or VIII at a concentration of 0.1-40% of an element of group VIB, and/or 0.1 to 30% of an element of group VIII (% by weight of oxide),
- [above 0 to] at most 20% (% by weight of oxide) of at least one promoter element that is selected from the group consisting of boron, silicon and phosphorus,
- 0-20% of at least one element of group VIIA,

and in which the zeolite contains in its porous network (in % by weight of oxide in the catalyst) at least one of the elements of groups VIB and/or VIII at a concentration of 0.1-10% by weight of an element of group VIB and/or 0.1-10% by weight of an element of group VIII.

10. (Twice Amended) A catalyst according to claim 1, prepared by:

- a) introducing into the zeolite at least one element of group VIB and/or group VIII;
- b) mixing the zeolite with the matrix and shaping the resultant mixture to obtain the substrate, and



c) introducing at least one promoter element by impregnation and introducing at least one hydro-dehydrogenating element in the matrix or on the substrate by at least one of the following methods so as to obtain a final product:

adding at least one compound of said [hydro-hydrogenating] hydro-dehydrogenating element during the shaping to introduce at least a portion of said element,

-- impregnation of the substrate with at least one compound of said [hydro-hydrogenating] hydro-dehydrogenating element;

d) drying and calcining the final product and optionally drying and/or calcining intermediate products obtained at the end of stages a) or b) or after [an] the impregnation (c).

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